Neural stem cells improve memory in an inducible mouse model of neuronal loss.

Journal: J Neurosci

Publication Year: 2007

Authors: Tritia R Yamasaki, Mathew Blurton-Jones, Debbi A Morrissette, Masashi Kitazawa, Salvatore Oddo, Frank M LaFerla

PubMed link: 17978032

Funding Grants: Stem Cell Research Training Grant

Public Summary:

Scientific Abstract:
Neuronal loss is a major pathological outcome of many common neurological disorders, including ischemia, traumatic brain injury, and Alzheimer disease. Stem cell-based approaches have received considerable attention as a potential means of treatment, although it remains to be determined whether stem cells can ameliorate memory dysfunction, a devastating component of these disorders. We generated a transgenic mouse model in which the tetracycline-off system is used to regulate expression of diphtheria toxin A chain. After induction, we find progressive neuronal loss primarily within the hippocampus, leading to specific impairments in memory. We find that neural stem cells transplanted into the brain after neuronal ablation survive, migrate, differentiate and, most significantly, improve memory. These results show that stem cells may have therapeutic value in diseases and conditions that result in memory loss.